

Species distribution modelling of endemic grasshopper species in agro-natural mosaics of the Cape Floristic Region (CFR), South Africa



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INTRODUCTION

- Species distribution models (SDMs) are an important instrument for forecasting the potential future impact of environmental changes, especially in biodiversity hotspots that are heavily utilised for agricultural production (e.g. CFR), (Howard et al., 2014).
- Because of increasing agricultural activity, the survival of endemic flightless grasshoppers that inhabit native vegetation may be threatened; and, since they are particularly sensitive to change, it is important to model and predict their response to changes before they occur.

Hypothesis tested:

- Species that occur only in fynbos (and not in agricultural fields) will be more sensitive to future scenarios of expanded agriculture than species that occur in both fynbos and agricultural fields.
- The more sensitive a species, the larger the difference will be between its current and future distribution under predicted habitat and climate scenarios.

METHODS

- A 50x50m quadrat was delineated at the centre of each site, which two collectors sampled for 30 min on four occasions.
- 46 sites: 16 vineyards, 14 orchards, 16 fynbos.



IMPACT

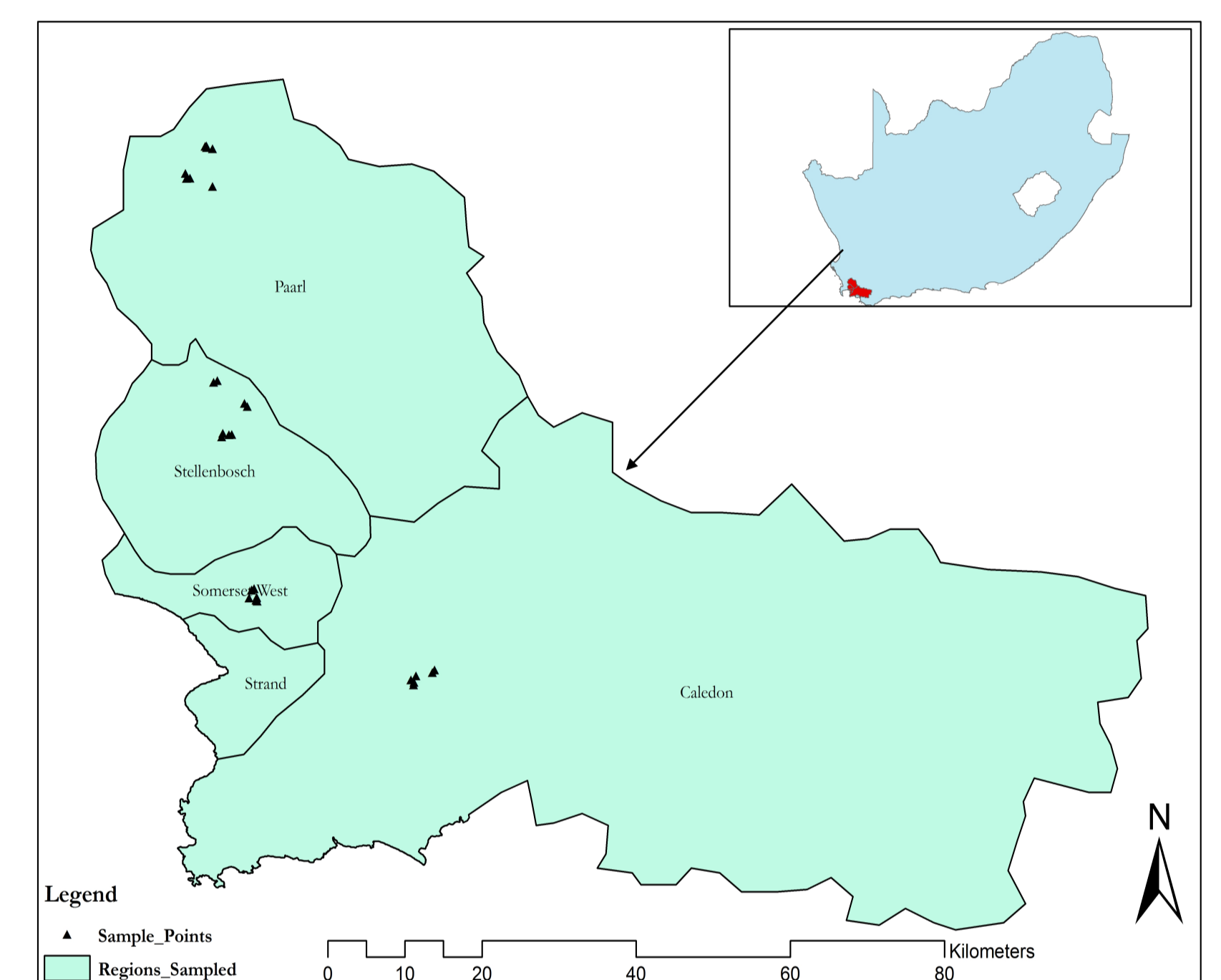
- This research can be used for future planning of biodiversity conservation in agricultural production land uses.
- It can reduce time for sampling and also narrow down on search areas of mapped species.

OBJECTIVES

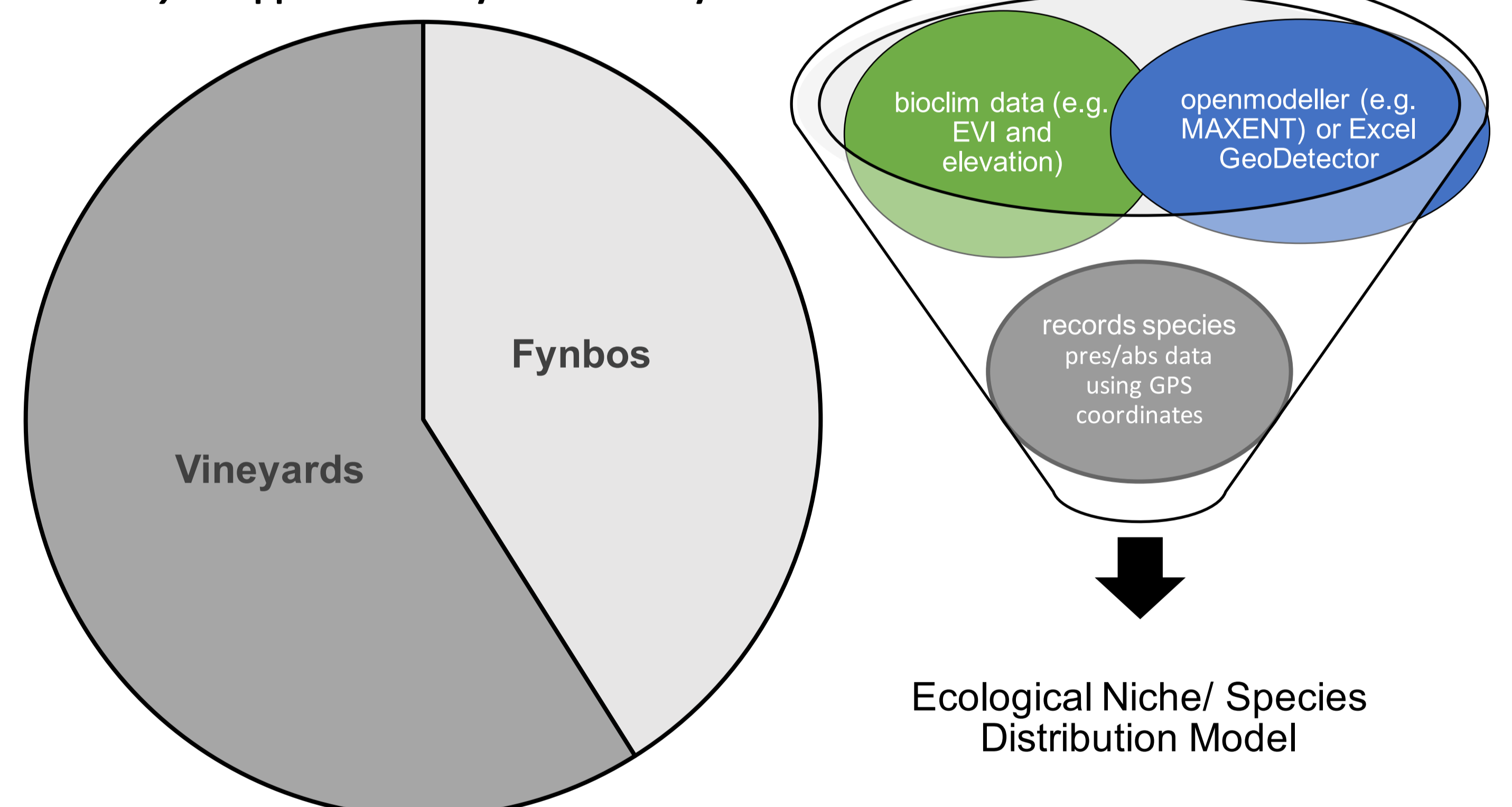
- To develop a species distribution model for the flightless fynbos endemic grasshopper species: *Euloryma lapollai*, *E. ottei*, *E. umoja*, *E. larsenorum*
- To predict the possible effect of future expansion of agriculture into fynbos vegetation on *Euloryma* species that are endemics to fynbos and others that are associated with both agriculture and fynbos.

DATA ANALYSIS

- To assess the effect of bioclimatic data on vegetation.
- Compute mean annual EVI from bi-temporal Landsat data for the agricultural and the natural (fynbos sites).
- Correlate EVI with occurrence data.



Euloryma spp. found in fynbos vs vineyards



REFERENCE

Howard C., Stephens P. A., Pearce-Higgins J. W., Gregory R. D. and Willis S. G. (2014) Improving species distribution models: The value of data on abundance. *Methods in Ecology and Evolution* 5, 506–513. doi: 10.1111/2041-210X.12184.